

Memorandum

To: GoTriangle Board of Trustees
From: John Tallmadge, Interim Project Director – Light Rail
Date: February 19, 2019
Re: Update #2 on Negotiations with Duke University

On November 20, 2018, GoTriangle Board Chair Ellen Reckhow, Board members Mayor Steve Schewel, and Commission Chair Wendy Jacobs, Jeff Mann and I met with Duke University President Vincent Price, Health System Chancellor Eugene Washington, Executive Vice President Tallman Trask, and Vice President Michael Schoenfeld to request Duke University's support for the light rail project and follow-through on their consideration of a property donation needed for the alignment. In response, President Price sent a letter articulating their key concerns and appointing Dr. Trask as their principal liaison for the GoTriangle-Duke relationship. He expressed that Dr. Trask will have the sole authority to provide information and make decisions on all operational issues regarding Duke's participation in the D-O LRT Project. The identified concerns were:

1. The closing of Blackwell Street and access to the American Tobacco Campus, DPAC and neighboring locations;
2. Making certain that access to the Duke Hospital Level I Trauma Center remains unimpeded for all emergency vehicles at all times;
3. Minimizing disruptions during the construction process and maintaining complete access to Trent Drive and other essential patient transit and access points;
4. Ensuring the continuity and safety of research and clinical activities that take place in buildings adjacent to the planned rail line;
5. Guaranteeing the electric power supply for Duke University and its medical facilities, and;
6. Reconsidering Duke's request that the planned line be elevated over State Road 751 to facilitate safety and avoid addition congestion during peak periods and special events.

Since then, Dr. Trask and I met on November 26th, had a phone discussion on December 5th, and met again on January 14th. We also met jointly with our staffs on December 12th, December 19th, January 11th, and January 16th. Our progress on the issues of concern are detailed below.

Since the January update, I have met again with Dr. Trask on January 30th and February 18th. Utilities teams have met on several occasions. An executive leadership meeting was held on February 8th. Updates since the January memo are provided in italics at the end of each section below.



1. **Blackwell Street railroad crossing closure** – Since beginning these negotiations with Duke in November, GoTriangle has proposed a new design solution along Pettigrew Street to address Norfolk Southern Railroad’s objection to shared crossing gate operations that would have been required at Mangum Street and Dillard Street with the light rail system operating at street level. This new design solution includes a tunnel under the intersections with Blackwell and Mangum Streets, keeping Blackwell Street open to people walking, biking, or riding in vehicles at the railroad crossing. Dr. Trask has indicated that this proposal has addressed their concern about Blackwell Street. *No change since January.*

2. **Access to Emergency Drive and Trent Drive south of Erwin Rd during construction** – Dr. Trask has been clear that both of these access roads need to be open throughout construction. With the assistance of our consultants, we described the Maintenance of Traffic proposals for each intersection along Erwin Road from Research Drive to Flowers Drive. While indicating that there are details to be worked through, Dr. Trask acknowledged that we could satisfactorily address this concern through the final design period. *No change since January.*

3. **Emergency Vehicle Pre-Emption (EVP) system** – GoTriangle is proposing to implement an emergency vehicle pre-emption system, enabling emergency response vehicles to communicate with traffic signals to change them to green. GoTriangle will equip the traffic signals in the vicinity of the Hospital with Emergency Vehicle Preemption (EVP) equipment to provide an additional level of flexibility for emergency vehicle operators to navigate the corridor during and following construction of the light rail line. GoTriangle has reviewed this proposal with Durham County EMS who operate many of the ambulance services to the Duke Trauma Center and they are comfortable with the proposal.

GoTriangle and Duke agreed to coordinate to determine which traffic signals will be upgraded with this technology. The Parties acknowledge that use of EVP at the traffic signals requires emergency vehicles operating in the corridor to be equipped with EVP transponders. Dr. Trask has some concerns about the EVP system we’ve proposed, namely that vehicles come from all over the state, and outside the state, and that Duke can’t provide all of them with transponders. He has also said that there are some concerns about liability from claims against Duke if the EVP doesn’t function properly. Duke’s attorneys are preparing language for our review. *This liability language took the form of broad indemnification language that is described further below.*

4. **Global Health Research Center** – Dr. Trask provided information about the National Institutes of Health requirements for building security, including a 100-foot buffer and impediments that would prevent a large vehicle from crashing into the building. GoTriangle has confirmed with our consultants that the finished structures will be 106 feet from the GHRC Building. We have committed to develop a plan that meets the NIH security requirements during construction and in the finished condition. These plans will be reviewed by Duke University and Health System. Dr. Trask indicated that Duke University would consider cost-sharing in the implementation of protective structures. *No further update since January.*

5. **Noise and vibration** – Dr. Trask has repeatedly indicated that he does not have a significant concern with vibration during operation of the light rail system, but recently raised questions about how our design for the bridge compared with the techniques that Metro Transit used in Minneapolis proximate to the medical center. We shared information on January 16th about the vibration-muting design techniques that are included in the current bridge design that are similar to those in the at-grade design in Minneapolis. Dr. Trask has been clear that his primary concern is that we cannot construct the aerial light rail structure nor rebuild Erwin Road without unacceptable levels of vibration that would disrupt research and put patients at risk.

We agree that neither patient safety nor research integrity should be compromised due to vibration during construction. This is a concern that transit agencies and universities and medical centers have typically had to work through in preparation for construction. While we know we require solutions that are specific to this project next to Duke Health System's facilities, we have a list of 20 medical centers around the country with rail systems in close proximity that are useful examples that solutions will be found through cooperation. Dr. Trask maintains that he is not sure that we can meet the thresholds that they would require and doesn't want to sign an agreement allowing the light rail project to move forward, only to have to request it to stop because vibration was disrupting patient care or research activities. We agree that we must plan appropriately to avoid such risks. The two construction activities that are of most concern to Dr. Trask are drilling of the holes (nine feet in diameter and thirty-five to forty feet deep) required for the aerial structure supports and the rolling of pavement along Erwin Road.

On January 16th, our construction management consultant communicated to Duke that it had contacted three construction firms to inquire whether they would be willing to bid on our contract given the most stringent vibration thresholds that we have received from Duke Medical Center, and with a description of the structures to be built close to the Medical Center buildings. All three responded that they would be willing to bid due to their confidence that construction methods were available and that appropriate care could be taken to meet the vibration thresholds. Techniques that are available to contractors include drilling the holes with different size bits or at slower speeds, and avoiding the use of vibratory rollers for the pavement.

GoTriangle has proposed agreeing to the following approach for addressing Duke's concerns:

First, GoTriangle agreed to design the elevated guideway as a segmental box girder bridge so the girders can be erected using equipment on top of the structure and not in the roadway. This method of construction has the least impact to Erwin Road traffic of the options considered.

Second, GoTriangle has proposed to mutually establish, with Duke, tolerance thresholds for allowable noise and vibration during construction and to include such thresholds in the construction contracts. (We have proposed to use language that Duke uses in its own construction contracts and have requested that language. Dr. Trask has committed to provide us that language by January 26.) These thresholds will be based on identified vibration-sensitive hospital equipment,

ambient conditions, specific construction activities, existing soil conditions, building structure assessment and conditions, guidelines used for previous Duke construction projects near their facilities, and FTA Noise and Vibration construction assessment guidance. In order to determine some of these factors, GoTriangle will need to conduct baseline vibration monitoring, and has communicated that to Dr. Trask. He has requested a written monitoring plan. We require additional information from Duke about the vibration-sensitive equipment and have requested that information verbally. On January 14th, Dr. Trask committed to provide that list and to work with us to allow for vibration monitoring in the buildings with sensitive equipment once we provide a written request. We are following up with a written request for this information.

Third, GoTriangle will include contractual requirements to investigate actual vibration propagation from construction activities in a location remote to Duke's sensitive receptors and use this information to confirm the effectiveness of mitigation strategies employed in the actual construction operations prior to working in the proximity of areas defined as vibration sensitive. This likely would be done during construction activities on Erwin Road near LaSalle Street, away from the sensitive equipment. Dr. Trask has suggested that we consider drilling a test shaft for the aerial structure piers now so that we can all have the data about the vibration of the construction techniques before proceeding to construction. Our concerns with this approach are: we don't have a location where we can do this and we would need to find a location with similar soil conditions to Erwin Road; we don't have an existing contract with a construction firm that could do the work; and we don't agree that the information that this test would generate is necessary for Duke to be assured that the construction can be completed in a way that keeps patients safe and protects the integrity of research.

Fourth, GoTriangle will continuously monitor construction activities for noise and vibration against the established thresholds and will establish a contractor notification protocol. This will be done with sensors that are placed at the construction sites and inside Duke facilities. Duke will have access to this real-time noise and vibration monitoring data through a Stakeholder website and app. If the established thresholds are exceeded, contractors will be notified immediately and compelled to cease operations and implement suitable mitigation to bring the construction activity back into compliance with the contractually-mandated threshold prior to resuming work.

Based on the experience of our Construction Management Consultant and their recent confirmation from experienced construction contractors, GoTriangle is confident that construction techniques will be able to comply with the jointly established vibration criteria. Right now, Dr. Trask remains concerned that there may not be acceptable construction techniques to drill the holes for the aerial structure supports or the new pavement rolling.

Since January, Dr. Trask has said both that this can probably be worked out, but also that it remains a concern. On January 30, Dr. Trask provided a document titled Guidelines for Working around Duke Health Facilities, dated January 9, 2019. This document includes a construction vibration threshold that is 40 times more stringent than the standard for especially sensitive operating rooms. In clarifying whether there was a misunderstanding about the units of measurement in the Guidelines, Dr. Trask replied that they have "very aggressive standards." The standard in the guideline was 10 times more

stringent than the most stringent activity that Dr. Trask has said he is concerned about – cell implant devices. He did acknowledge that it “Will take some very complicated calculations to determine exactly how high we might agree to.” In the revised cooperative agreement sent to Dr. Trask on February 15, we proposed the methodology described above for determining those levels to ensure that their sensitive equipment is protected, and commit to how we would monitor construction vibration levels and hold our contractors to meeting them.

6. Electromagnetic Interference (EMI) - sensitive equipment – On November 26th, Dr. Trask introduced concern about potential impacts of Electromagnetic Interference (EMI) generated by the light rail operations on sensitive electronic equipment in the medical center buildings. We have provided Dr. Trask with the list of buildings with EMI potential impacts, and the analysis that shows the distances from the train that there could be impacts to equipment, and what types of equipment that EMI can impact. We have requested Dr. Trask to provide us with the information that we need about the location of EMI-sensitive equipment so that we can complete the next step of analysis to determine whether there are specific machines that will need protection. Dr. Trask has raised two issues. First, given his concern about the adequacy of GoTriangle’s analysis, he has given our report to three electrical engineering faculty and asked them to review it to let him know whether the methodology and conclusions are sound. Second, Dr. Trask is concerned that light rail operations will limit where new equipment, perhaps more sensitive to EMI, can be placed in their buildings along Erwin Road.

GoTriangle is updating the EMI analysis for the elevation of the LaSalle Street station and expects to have that report complete by the second week of February. We have also recently learned that Maryland Transit Administration agreed to mitigate EMI impacts of the Purple Line light rail train on the University of Maryland’s equipment, including future equipment, with “at-the-receptor” protection. We will discuss a similar approach with Dr. Trask.

This has been determined by Dr. Trask to be the most important remaining issue, because he is not comfortable that there is a solution. On January 30, Dr. Trask provided a 24-page hardcopy list of Duke Medical Center assets worth more than \$50,000. Our consultants with expertise in EMI-sensitive equipment reviewed the document and identified two electron microscopes and six magnetic resonance imaging machines that could be susceptible to EMI. I have requested more detailed information about these eight devices and their specific locations from Dr. Trask, and have been told his concern is not limited to these devices, and that Duke is “not willing to permanently compromise what patient care devices we can put in our hospital and clinics, how or where.” We have sent draft cooperative agreement language that commits to mitigating the effects of light-rail generated EMI on all future equipment, assuming that Duke makes reasonable efforts to locate EMI-sensitive equipment outside of the disturbance zones of the light rail.

On February 18, we transmitted a revised EMI analysis report, and the underlying data to Dr. Trask. He has sent that to a consultant that they have hired to review the analysis and has indicated that the consultant’s review will take one or two weeks. The revised analysis does not reveal impacts that are much different than the previous analysis showed.

7. **Alignment** – On November 26th, Dr. Trask said that the alignment shift that would push Erwin Road north is not worth the cost for the 20 feet of trees saved. He was interested in whether the sidewalk was still in the design between Cameron and Towerview. We reviewed the current engineering drawings with Dr. Trask and his team in December, and noted that the sidewalk between Cameron and Towerview remains in the design. In addressing concerns about a narrow area for underground utility relocation, GoTriangle is relocating one of the vertical circulation elements at the Duke/VA Medical Centers station on Duke’s side of Erwin Road.

Dr. Trask expressed that the extension of a light-rail bridge over Cameron Boulevard is going to be important for special-event traffic flow. We have stated that unless a new traffic analysis based on updated traffic counts provided by Duke demonstrates that the at-grade crossing results in unacceptable traffic delays, GoTriangle will consider this as a request for a betterment and the cost would need to be borne by Duke University. With this understanding, and at Duke’s request, we have begun to develop a design alternative for the bridge extension over Cameron Boulevard.

In January, Dr. Trask asked to see the extent of the proposed median barriers protecting the aerial structure piers in Erwin Road. In reviewing those plans, he raised concerns that they did not provide adequate breaks for emergency vehicles to navigate around backed-up traffic on either side of the Emergency Drive entrance. GoTriangle agreed to evaluate whether breaks could be created in the barriers to accommodate emergency vehicle movements. *GoTriangle has since developed an alternative design that creates more breaks in the pier barriers to address this concern. This will be shared at an upcoming meeting. No other alignment changes have been requested by Dr. Trask since November 20th.*

8. **Maintaining Power to the Medical Center** – The utility design teams from GoTriangle and Duke have met to discuss Duke’s concerns about “pinch points” for utility relocation. GoTriangle has made a design change to the aerial station at the Medical Center to create more space for the utility relocation, and our engineering consultant has contracted with Duke’s approved utility design firm to develop the utility relocation designs. We are confident that we have an electric utility relocation design that protects the underground 44KV line and assures power continuity throughout the period of construction. We have sent those drawings and plans for power redundancies to Duke University and Duke Energy for their review. A “utility summit” to go through these drawings is scheduled for February 5th.

At this “utility summit,” Duke University staff raised concerns with our solution because they did not want us to temporarily use an above-ground power pole during the utility relocation work. This is standard practice, and we commit to installing protections for the pole for the period that it would be in service. Power redundancies have also been explained. An alternative utility design would require Duke Energy to authorize us to build a retaining wall closer to the 44kv line, and we are also pursuing this approach.

9. **Property Donation** – Duke University signed a non-binding memorandum of understanding with GoTriangle in December 2016 indicating that they would consider donating the property required for

the light-rail project on Duke property. GoTriangle has expressed a desire for Duke to execute such a property donation agreement as a demonstration to the community that Duke is working toward an agreement. It would also aid in our communication with the FTA, and private project sponsors, about the progress we are making in negotiations with Duke. On November 29th, GoTriangle sent a current version of the draft donation agreement language for their consideration. Dr. Trask has said that he brought this request forward for consideration at the Duke Board meeting at the beginning of December, but at that time they were not willing to sign the property donation agreement while they still had outstanding concerns. *No change, but they have reiterated if terms can be reached on the cooperative agreement then they still intend to make the property donation.*

10. Relocation of Duke Transit Operations Facility – GoTriangle’s property donation request includes the property east of Buchanan Boulevard between North Carolina Railroad property and the Durham Freeway. This property is currently occupied by the Duke transit operations facility and other equipment/operations. GoTriangle has communicated that the relocation of those functions and structures must occur prior to the middle of 2020 in advance of construction work. Dr. Trask said this was reasonable if Duke is able to move into an existing facility, but too soon if a new facility needs to be built. In response, and following further review of the projected construction schedule, GoTriangle has changed the requested date for relocation of the current functions to January 1, 2021. GoTriangle has discussed with Duke whether they would like to retain property on this site for development adjacent to the Buchanan Boulevard Station. At this time, they have indicated that they are not interested in retaining those properties, but we will discuss those opportunities with them further. *No change, but this is still seen by Dr. Trask as something that can be worked out.*

11. Cooperative Agreement - The purpose of the cooperative agreement between Duke and GoTriangle is to identify the ways in which the parties will cooperate to address or resolve remaining issues or to mitigate identified impacts throughout the remainder of engineering, construction, and operations. It is also an agreement that the light rail project can proceed subject to the requirements defined in the cooperative agreement. All of the issues in this update are expected to be covered in the Cooperative Agreement with Duke. We provided revised language at the beginning of January. Following more recent discussions about construction vibration and EMI mitigation, GoTriangle will be proposing further changes to these sections. *These changes were sent to Dr. Trask on February 15.*

Dr. Trask sent us draft language regarding indemnification on February 5th. The terms of this language were unacceptable in that they required GoTriangle and the State of North Carolina to indemnify Duke University against any and all liabilities related directly or indirectly to the light-rail project and to secure \$2 billion in a letter of credit or bond to insure the indemnification.

On February 8, GoTriangle Board Chair Ellen Reckhow, Durham Mayor Steve Schewel, Durham County Chair Wendy Jacobs, GoTriangle CEO Jeff Mann, and I met with Duke President Vincent Price, and Executive Vice President Tallman Trask. Duke Vice President of Public Affairs and Government Relations Mike Schoenfeld, Vice President of Durham Affairs Stelfanie Williams, and GoTriangle Director of Communications Mike Charbonneau also attended.

The purpose of the meeting was to reiterate the importance of Duke's cooperation on the project and the urgency of making a decision on the cooperative agreement and the property donation by the end of February. President Price and Dr. Trask reiterated that they need to be satisfied that the light rail will not compromise their clinical and research operations, and that they are not convinced that EMI will not be a significant problem. They also indicated that the indemnification is important because they are a \$2 billion per year operation and there are many risks and unknowns about the light-rail project. When pressed to give an answer about whether President Price had already made up his mind, he replied that it was unlikely that he could be made comfortable, but that the odds were not zero and that they would continue to work in good faith on the issues. As noted above, we continue to work on the issues of EMI and indemnification.

We have since learned that the Duke Board of Trustees meets February 21 through 23.

